



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference 02 01 623 285		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/DK 03/00733	International filing date (day/month/year) 30.10.2003	Priority date (day/month/year) 01.11.2002	
International Patent Classification (IPC) or both national classification and IPC F23K5/04			
Applicant DANFOSS A/S et al.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 2 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>			
Date of submission of the demand 21.05.2004		Date of completion of this report 30.09.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Theis, G Telephone No. +49 89 2399-2787 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

10/533142
JC20 Rec'd PCT/PTO 27 APR 2005
International application No. PCT/DK 03/00733

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, Pages

1-11 as originally filed

Claims, Numbers

1-8 filed with telefax on 16.08.2004

Drawings, Sheets

1/6, 3/6-6/6 as originally filed

2/6 received on 26.11.2003 with letter of 19.11.2003

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations

see separate sheet

Reference is made to the following documents :

D1 US 2 760 564 A
D2 US 2 832 403 A
D3 US 2 117 512 A

V. Statement under Article 35(2)

- 1) Document D1 (Figs.1,3,5), which may be considered as the closest prior art, discloses liquid fuel supply unit for a liquid fuel burner according to the preamble of claim 1. The rotary impellers of the compressor and of the fuel feed pump respectively are mounted on a single shaft. The supply unit is coupled to one end of the shaft of a secondary air blower by means of a flexible coupling. The other end of said blower shaft is coupled to the drive motor. Hence the subject-matter of claim 1 is new in the sense of Article 33(2) PCT.

The supply unit in D2 (Fig.2) is of similar construction as the supply of D1 with the compressor and the pump mounted onto a single shaft. Even though this shaft can be connected to any drive means, mounting the rotor of the drive means onto the same shaft is not suggested or otherwise made obvious. In the supply unit of D3, the impeller of the compressor, the impeller of the pump and the rotor of the electric motor each has its own shaft. These shafts are then connected by means of couplings to one another. Thus none of prior art at hand discloses a unitary shaft comprising the rotary impellers of the compressor and of the fuel feed pump as well as the rotor of the driving motor so that a skilled person cannot derive the claimed invention therefrom without inventive skill. Hence the subject-matter of claim 1 involves an inventive step in the sense of Article 33(3) PCT.

- 2) The inventions defined in claims 2 - 8 represent further developments of the invention of claim 1. Hence the subject-matter of these claims is new in the sense of Article 33(2) PCT and involves an inventive step in the sense of Article 33(3) PCT. The industrial applicability of the claimed invention is obvious.
- 3) To meet the requirements of Rule 5.1 (a) (ii) PCT, relevant prior art documents D1,D2,D3 should have been identified in the description and the background art disclosed therein should have been briefly discussed.

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NEW PATENT CLAIMS

1. A liquid fuel supply unit (101; 101') for a liquid fuel burner (106) with a gas atomizing nozzle (105), the supply unit (101; 101') comprising a liquid fuel feed pump (102; 102'), a compressor (104; 104') and a motor (30; 30'), said liquid fuel feed pump (102; 102') having an inlet (21) connectable to a liquid fuel conduit from a liquid fuel source, such as an oil tank, and an outlet connectable to an inlet (24) of a liquid fuel metering device (103; 103'), said compressor (104; 104') having an outlet being connectable to the gas atomizing nozzle (105) of the liquid fuel burner (106), characterized in that the unit comprises a unitary common drive shaft (3; 3'), the liquid fuel feed pump (102; 102') and the compressor (104; 104') both comprise a rotary impeller (8; 12) and the motor (30; 30') comprises a rotor (31) where the rotary impellers (8; 12) and the rotor (31) are mounted on the unitary common drive shaft (3; 3').

2. A supply unit according to claim 1, characterized in that the motor is placed between the compressor and the liquid fuel feed pump.

3. A supply unit according to any of the claims 1 and 2, characterized in comprising a modulatable liquid fuel metering device (103; 103').

4. A supply unit according to claim 3, characterized in that the liquid fuel metering device (103') comprise a metering orifice (203) and a

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valve (202; 206).

5. A supply unit according to claim 3, c h a r -
a c t e r i z e d in that the liquid fuel metering
device (103) is a metering pump.

5 6. A supply unit according to claim 5, c h a r -
a c t e r i z e d in that the metering pump is a
piston pump activated by an electro magnet (17)

7. A supply unit according to one of the claims
1-6, c h a r a c t e r i z e d in that the
10 compressor (104; 104') is a vane pump.

8. A supply unit according to one of the claims
1-7, c h a r a c t e r i z e d in that the liquid
fuel feed pump (102; 102') is a gerotor pump.